

Paediatrics and paediatric surgery

IN THE ARENA OF CHILD HEALTH, there is no better example of efficacious and cost-effective prevention than vaccination.

The World Health Organization Global Polio Eradication Initiative has resulted in a 99% decline in polio cases since 1988, half in the past two years.¹ Australia has contributed by the surveillance, since 1995, of acute flaccid paralysis (AFP), under the auspices of the Australian Paediatric Surveillance Unit, and in October 2001 the Western Pacific Region, including Australia, was certified polio free.²

Haemophilus influenzae type B vaccination has dramatically reduced the incidence of meningitis in the past 10 years, and the introduction of multivalent-protein conjugate pneumococcal vaccines that are immunogenic in young children will further reduce meningitis as well as other overwhelming sepsis. Rotavirus vaccines are on phase II clinical trials, with tremendous potential to save lives in developing countries, as well as reduce morbidity in developed countries.

In paediatric surgery, sophisticated new diagnostic and assessment techniques are guiding progress in acute and chronic conditions. In severe intractable epilepsy, electrode implantation and intraoperative electrocorticography, somatosensory evoked potentials and cortical stimulation allow precise localisation of seizure foci and mapping of brain function, then accurate surgical resection. Outcomes include dramatic reduction or cessation of seizures and improved behaviour.

Children with spastic cerebral palsy are at high risk for secondary hip dislocation, leading to severe pain and loss of mobility. In the past, late diagnosis has meant that by the time surgery was performed the child had often been wheelchair-bound for years, with scoliosis and other musculoskeletal deformities making anaesthesia, surgery and post-operative care very difficult and potentially dangerous.

Electronic gait laboratories can now be used to diagnose early signs of hip dislocation in high-risk patients, leading to preventive surgery and thus avoiding reconstructive surgery or complex salvage surgery.³ Thus, such use of the gait laboratory has the capacity to improve the general health and quality of life in children who are disadvantaged by severe physical disability.

Over the past 10 years there have been dramatic findings in the neurobiological, behavioural and social sciences, leading to new understanding of the highly interactive influences of genetics and the environment on brain development and behavioural maturation in early childhood.⁴

There are critical periods of development when the brain is primed to respond to particular stimulation. If these

sensitive periods are missed, brain structure and function is altered, sometimes with long term consequences. This concept of “use it or lose it” has long been recognised in absent language development in profoundly deaf children, or “cortical blindness” in children with uncorrected congenital cataracts. Now there is evidence for similar critical periods in early childhood for development of emotional control and self-regulation.⁵

There is evidence that the midlife “epidemics” of cardiovascular disease, obesity and diabetes have their origins in fetal, perinatal and early-childhood nutrition and hormonal patterning. The socioeconomic gradient of health is apparent from the very early years. Governments around

the world are using such evidence to drive a multisectoral or whole-of-government approach to early childhood, linking health, education and social services to provide a more optimal environment for the healthy development of children within their families.

In Australia we have strong primary care health networks, almost universal access to education from the age of about four years, and complex systems of child care, family support and other social services. We have an opportunity to build on this infrastructure as we focus priorities on children and families.

Child health professionals have a particular responsibility to use evidence-based advocacy, whether in their clinics, their community or their country, for appropriate linking of all services that promote healthy development of children.

The future direction for research which will make a measurable difference to children's health lies in prevention and public health — including immunisation, gene therapies, prevention of obesity, promotion of literacy, and support for families and communities in the care of the young child.

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Figure: Courtesy of Dr Ralph Hanson, The New Children's Hospital, Sydney, NSW.

1. Global Polio Eradication Progress 2000. Geneva: Department of Vaccines and Biologicals, World Health Organization, 2001.
2. Annual report. Sydney: Australian Paediatric Surveillance Unit, 2000.
3. Dobson F. Hip surveillance in children with cerebral palsy: impact on the surgical management of spastic hip disease. In: Annual Quality Report 2001. Melbourne: Women's and Children's Health, Royal Children's Hospital, 2001.
4. Shonkoff J and Phillips D, editors. National Research Council and Institute of Medicine. From neurons to neighbourhoods: the science of early child development. Washington DC: National Academy Press, 2000.
5. McCain M, Mustard F. The early years study – reversing the real brain drain. Report from the Canadian Institute for Advanced Research to the Ontario

